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(71)Applicant : TOKAI RIKA CO LTD

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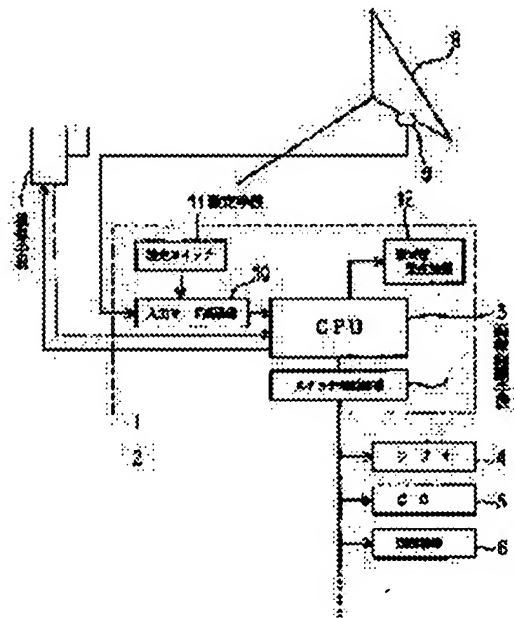
(72)Inventor : HORIBA TAMOTSU

(54) OPERATION SIGNAL OUTPUT DEVICE

(57)Abstract:

PROBLEM TO BE SOLVED: To facilitate operation of plural objects by selectively outputting an operation signal to the operation object corresponding to a recognized image pattern among the plural operation objects.

SOLUTION: When a driver shows a specified sign (such as rising the forefinger) within a prescribed range with his hand or the like in an environment including plural operation objects 4-6 such as inside an automobile, the image of that specified sign is picked up by an image pickup means 1. Then, the pattern of the picked-up image is recognized by an image recognizing means 3, and an operation signal corresponding to the image pattern is selectively outputted through a switch driving circuit 7 to the operation objects 4-6 corresponding to the image pattern. Therefore, it is not necessary for the driver to perform operation while extending his hand to an operating switch provided on the operating objects 4-6 after visually confirming the position of that operating switch, and the plural objects 4-6 can be easily operated.



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CLAIMS

[Claim(s)]

[Claim 1] The actuation signal output unit characterized by to provide the image pick-up means for picturizing a part of human being's body to predetermined within the limits, the image-recognition means which carry out the pattern recognition of some images of said human being's body picturized by this image pick-up means, and an actuation signal output means output an actuation signal to the candidate for actuation corresponding to the image pattern recognized by said image-recognition means in for [two or more] actuation alternatively.

[Claim 2] The actuation signal output unit according to claim 1 characterized by providing the setting means for setting beforehand the correspondence relation some image patterns of said human being's body, and for [which output said actuation signal / said] actuation as said actuation signal output means.

[Claim 3] Said actuation signal output means is the actuation signal output unit according to claim 1 or 2 it carries out [output unit] outputting an ON actuation signal if the candidate for specific actuation concerned is an OFF state, and outputting an off actuation signal if the candidate for specific actuation concerned is an ON state as the description with reference to the on-off condition for [concerned] specific actuation, when the common image pattern corresponding to the on-off operation for [which has been recognized by said image-recognition means] specific actuation is given.

[Claim 4] Some image patterns of the body of said human being for outputting the increment signal in a control input and a control input reduction signal to said two or more candidates for actuation are communalized, respectively. Said image recognition means Said predetermined range is divided into two or more partitions corresponding to said two or more candidates for actuation, and it constitutes possible [recognition] in the any said image pattern was picturized. Said actuation signal output means An actuation signal output unit given in claim 1 thru/or any of 3 they are. [which is characterized by outputting said increment signal in a control input, or said control input reduction signal to the candidate for actuation corresponding to the partition where the image pattern concerned has been recognized if said image recognition means recognizes said image pattern]

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DETAILED DESCRIPTION

[Detailed Description of the Invention]**[0001]**

[Field of the Invention] This invention relates to the actuation signal output unit for outputting an actuation signal to two or more candidates for actuation.

[0002]

[Problem(s) to be Solved by the Invention] for example, the thing on the vehicle interior of a room of an automobile, and directly relevant to automobilisms, such as a light, a wiper, a door, and a mirror, -- in addition, many candidates for actuation, such as radio called the so-called accessory, CD or air-conditioning equipment, and car navigation equipment, are arranged, and an operator drives an automobile, operating these suitably if needed. However, there are the following problems about the operating environment of the present condition over the candidate for actuation of these large number.

[0003] First, actuation switches, such as radio, CD, and air-conditioning equipment, are in the inclination arranged intensively at the central part of an instrument panel, and the switch arranged at this part is far from an operator side, and it is hard to operate it. Moreover, since it is arranged intensively, it is unclear which actuation switch deals with which candidate for actuation only by glancing. Especially in volume adjustment of radio, airflow adjustment of air-conditioning equipment, etc., since the time amount by which the operator has turned the look to the switch side becomes long, front cautions will be neglected. This invention is made in view of the above-mentioned situation, and the purpose is in offering the actuation signal output unit which can operate two or more candidates for actuation easily.

[0004]

[Means for Solving the Problem] In order to attain the above-mentioned purpose, an actuation signal output unit according to claim 1 The image pick-up means for picturizing a part of human being's body to predetermined within the limits, The image recognition means which carries out pattern recognition of some images of said human being's body picturized by this image pick-up means, It is characterized by providing an actuation signal output means to output an actuation signal to the candidate for actuation corresponding to the image pattern recognized by said image recognition means in for [two or more] actuation alternatively.

[0005] If are constituted in Mr. ** and an operator shows a specific sign (an index finger is upraised) to predetermined within the limits by a hand etc. in the environment where two or more candidates for actuation are arranged like the vehicle interior of a room of an automobile for example, the specific sign will be picturized by the image pick-up means. Pattern recognition of the picturized image is carried out by the image recognition means, and an actuation signal output means outputs an actuation signal to the candidate for actuation corresponding to the image pattern which the image recognition means has recognized alternatively. Therefore, it becomes unnecessary even for the actuation switch to lengthen and operate a hand, after checking the location of an actuation switch established in candidates for actuation, such as radio and CD, by the eye unlike the former, and an operator can operate two or more candidates for actuation easily.

[0006] In this case, as indicated to claim 2, it is desirable to establish the setting means for setting

beforehand the correspondence relation some image patterns of said human being's body and for [which output said actuation signal / said] actuation as said actuation signal output means. If constituted in Mr. **, a user can set up the correspondence relation the sign shown by a part of body, and for [each] actuation so that it may be easy to operate itself.

[0007] As having indicated to claim 3, when the common image pattern corresponding to the on-off operation for [which has been recognized by said image-recognition means] specific actuation is given in said actuation signal output means, it is desirable in constituting so that it will output an ON actuation signal if the candidate for specific actuation concerned is an OFF state, and an off actuation signal may output with reference to the on-off condition for [concerned] specific actuation, if the candidate for specific actuation concerned is an ON state.

[0008] If constituted in Mr. **, by communalizing the specific sign shown by a part of body corresponding to ON actuation and OFF actuation, the number of said signs required in order to operate each candidate for actuation can be lessened, and it will become possible to operate it by the simple sign.

[0009] As indicated to claim 4, some image patterns of the body of said human being for outputting the increment signal in a control input and a control input reduction signal to said two or more candidates for actuation are communalized, respectively. Said image recognition means is divided into two or more partitions which correspond said predetermined range to said two or more candidates for actuation. Constitute possible [recognition in the any said image pattern was picturized], and if said image recognition means recognizes said image pattern, said actuation signal output means It is good to make it the configuration which outputs said increment signal in a control input, or said control input reduction signal to the candidate for actuation corresponding to the partition where the image pattern concerned has been recognized.

[0010] If constituted in Mr. **, while not setting up the specific sign corresponding to the increment signal in a control input, and a control input reduction signal for every candidate for actuation and being able to lessen the number of said signs, it can be operated more easily.

[0011]

[Embodiment of the Invention] Hereafter, this invention is explained with reference to a drawing about one example at the time of applying to an automobile. CCD camera (image pick-up means) 1 is on the left-hand side of an automobilism seat (right-hand drive), and in order to picturize the pattern (refer to drawing 2) shown within the limits of for example, 30-50cm square (refer to drawing 3) with an operator's left hand as predetermined range corresponding to various kinds of actuation signals, as the amount of CCD picture element part turns [CCD camera] to back from the front of a driver's seat, it is formed. The image pick-up signal of the CCD camera 1 is given to CPU (an image recognition means, actuation signal output means)3 of the switch control (Electric Contorol Unit) ECU 2.

[0012] In the vehicle interior of a room of an automobile, various candidates for actuation, such as radio 4, CD5, and air-conditioning equipment 6, are arranged. And if CPU (microcomputer)3 carries out the image processing of the image pick-up signal of CCD camera 1 and it carries out pattern recognition, it will output the actuation signal corresponding to the image pattern concerned to the candidate for actuation corresponding to the image pattern concerned through the switch drive circuit 7.

[0013] The pre input switch (validation switch) 9 is arranged by the wheel 8 of an automobile, and the output signal of the pre input switch 9 is given to CPU3 through the input mode processing section 10 of the switch control (ECU is only called hereafter) ECU 2. The pre input switch 9 consists of slide switches etc., and if ON actuation of the pre input switch 9 is carried out, CPU3 will validate actuation for [by the pattern shown on the left of / which was picturized by CCD camera 1 / an operator / various] actuation.

[0014] The configuration switch (setting means) 11 is formed in ECU2, and the output signal of the configuration switch 11 is also given to CPU3 through the input mode processing section 10. The configuration switch 11 is formed for every candidate for actuation, and when the pattern shown on the left of an operator and the various actuation for [various] actuation are matched beforehand and it sets them up, it carries out ON actuation. Moreover, ECU2 outputs the information sound for reporting

having outputted the actuation signal to the various candidates for actuation by giving a control signal to the information sound generator (actuation information means) 12.

[0015] Next, an operation of this example is explained also with reference to drawing 2 thru/or drawing 4. First, an operator does ON actuation of the configuration switch 11, and performs setting actuation for matching which actuation various kinds of patterns shown with their left hand perform.

[0016] For example, pattern ** to which pattern ** to which pattern (sign) ** which upraises a left index finger upraises the on-off operation, the index finger, and the middle finger of radio 4 upraises the on-off operation, the index finger, the middle finger, and the third finger of CD5 is made to correspond to the on-off operation of air-conditioning equipment 6, as an example is shown in drawing 2 ** - **.

[0017] Moreover, pattern ** which pattern ** (Pattern UP is called hereafter) which upraises the thumb turns the thumb of increase actuation of volume or airflow, and pattern ** below, and is shown While making CCD camera 1 show and picturize each pattern ** - ** so that it may make it correspond to reduction actuation of volume or airflow (Pattern DOWN is called hereafter) Each pattern and actuation are matched and the memory of the non-volatile which is not illustrated etc. is made to memorize them by carrying out ON actuation of the configuration switch 11 of ECU2, respectively.

[0018] And in outputting an actuation signal for [each] actuation into an automobilism, ECU2 operates by carrying out ON actuation of the pre input switch 9 according to the flow chart shown in drawing 4. In addition, in an initial state, each devices 4-6 shall be in an OFF state. By this drawing 4, CPU3 judges whether pattern ** - ** were picturized by CCD camera 1 in each decision steps S1-S5. When neither of the patterns is picturized but it is judged as "NO" in each steps S1-S5, the loop formation more than return is repeated to step S1.

[0019] Supposing the sign of that pattern ** is picturized from CCD camera 1 by an operator's being a left hand, for example, building the sign of pattern ** corresponding to the on-off operation of radio 4 from this condition, and being shown in the image pick-up range of CCD camera 1 (predetermined range), CPU3 will be judged to be "YES" in step S1 of "? with a pattern ** input", and will shift to the decision step S6 of "radio ON state ?."

[0020] In the decision step S6, it judges whether CPU3 has radio 4 in a current ON state by referring to the condition of the flag set when each devices 4-6 are made into an ON state, respectively. In this case, since radio 4 is an OFF state, it is judged to be "NO", and it shifts to the processing step S7 of "radio ON actuation."

[0021] In the processing step S7, while CPU3 outputs an ON actuation signal to radio 4 and makes radio 4 an ON state, it writes "1" in the flag storing field of RAM which the interior does not illustrate, and sets the flag (an ON state flag is called hereafter) which shows that radio 4 was made into the ON state. And it shifts to the processing step S8 of the next "ON information."

[0022] In the processing step S8, the information sound for reporting to an operator that CPU3 outputted the control signal to the information sound generator 12, and outputted the ON actuation signal to radio 4 is generated. what has a musical interval with a fixed information sound -- or it is desirable to make it a different thing according to each candidate for actuation so that to which candidate for actuation the actuation signal was outputted can distinguish as what does a short melody so. And it shifts to step S2.

[0023] On the other hand, when the ON state flag of radio 4 is already set in the decision step S6, CPU3 is judged to be "YES", sequential shift is carried out and processing about off actuation of radio 4 is performed to processing step S9 of "radio off actuation", and the processing step S10 of "off information."

[0024] That is, in step S9, if CPU3 outputs an off actuation signal to radio 4 and radio 4 is made into an OFF state, it will write "0" in the flag storing field of internal RAM, and will reset the ON state flag of radio 4. And in step S10, the information sound for reporting to an operator that CPU3 outputted the control signal to the information sound generator 12, and outputted the off actuation signal to radio 4 is generated.

[0025] Similarly, when pattern ** corresponding to the on-off operation of CD5 is picturized by CCD camera 1, CPU3 is judged to be "YES" in step S2 of "? with a pattern ** input", and shifts to the decision step S11 of "CD ON state ?." And the ON state flag of CD5 is referred to in the decision step

S11. or [shifting to the processing step S12 of "CD ON actuation", and the processing step S13 of "ON information", and performing processing about ON actuation of CD5 according to the result,] -- or It shifts to the processing step S14 of "CD off actuation", and the processing step S15 of "off information", and processing about off actuation of CD5 is performed. After that, it shifts to step S3.

[0026] Moreover, when pattern ** corresponding to the on-off operation of air-conditioning equipment 5 is picturized by CCD camera 1, CPU3 is judged to be "YES" in step S3 of "? with a pattern ** input", and shifts to the decision step S16 of "air-conditioning ON state ?." And in the decision step S16, the ON state flag of air-conditioning equipment 6 is referred to. or [shifting to the processing step S17 of "air-conditioning ON actuation", and the processing step S18 of "ON information", and performing processing about ON actuation of air-conditioning equipment 6 according to the result,] -- or It shifts to the processing step S19 of "air-conditioning off actuation", and the processing step S20 of "off information", and processing about off actuation of air-conditioning equipment 6 is performed. After that, it shifts to step S4.

[0027] Supposing it is picturized when it is in an ON state any of each devices 4-6 they are as mentioned above, and an operator builds the sign of Pattern UP with the left hand and shows the image pick-up range of CCD camera 1 CPU3 is judged to be "YES" in step S4 of "? with a pattern (setting in Area A, B, and C) UP input", and shifts to the decision step S21 of "ON state (responding to Area A, B, and C) ?."

[0028] four area (partition) where CPU3 comes to quadrisect the image pick-up range of CCD camera 1 shown in drawing 3 in step S4 -- inner -- in any of three area A, B, and C (Area D is intact), it distinguishes whether Pattern UP was picturized and UP actuation is performed for the candidate for actuation according to the area. Here, Area A, B, and C supports radio 4, CD5, and air-conditioning equipment 6, respectively.

[0029] That is, when Pattern UP is picturized in Area A, if radio 4 is an ON state and CPU3 is judged to be "YES" with reference to the ON state flag of radio 4 in the decision step S21, it will shift to the processing step S22 of "UP (responding to Area A, B, and C) actuation." And the volume of radio 4 is raised by outputting the increment signal in a control input to radio 4 (one step beforehand defined to one output of the increment signal in a control input).

[0030] Then, it shifts to the processing step S23 of "UP information", and if CPU3 generates the information sound for reporting having outputted the control signal to the information sound generator 12, and having outputted the increment signal in a control input to radio 4 to an operator, it will shift to step S1. Moreover, when radio 4 is an OFF state in the decision step S21, CPU3 is judged to be "NO", and it shifts to step S1, without processing especially.

[0031] When, as for the processing about the above UP actuation, Pattern UP is picturized in Area B and C, it is similarly carried out about CD5 or air-conditioning equipment 6, and volume is made to increase by one step in the case of CD5, and airflow is made, as for the case of air-conditioning equipment 6, to increase to it by one step.

[0032] Moreover, an operator builds the sign of Pattern DOWN with the left hand, and when picturized by being shown in the image pick-up range of CCD camera 1, CPU3 is judged to be "YES" in step S5 of "? with a pattern (setting in Area A, B, and C) DOWN input", and shifts to the decision step S24 of "ON state (responding to Area A, B, and C) ?."

[0033] And as well as the case of UP actuation when Pattern DOWN is picturized in Area A, if radio 4 is an ON state and CPU3 is judged to be "YES" with reference to the ON state flag of radio 4 in the decision step S21, it will shift to the processing step S25 of "DOWN (responding to Area A, B, and C) actuation." And the volume of radio 4 is decreased by outputting a control input reduction signal to radio 4 (one step defined beforehand).

[0034] Then, it shifts to the processing step S26 of "DOWN information", and if CPU3 generates the information sound for reporting having outputted the control signal to the information sound generator 12, and having outputted the control input reduction signal to radio 4 to an operator, it will shift to step S1. Moreover, when radio 4 is an OFF state in the decision step S24, CPU3 is judged to be "NO", and it shifts to step S1, without processing especially.

[0035] When, as for the processing about the above DOWN actuation, Pattern DOWN is picturized in Area B and C, it is similarly carried out about CD5 or air-conditioning equipment 6, in the case of CD5, volume is decreased by one step, and, as for the case of air-conditioning equipment 6, airflow is decreased by one step.

[0036] CPU3 of ECU2 carries out pattern recognition of the image on the left of [which was picturized by CCD camera 1] an operator, and distinguishes any of pattern **.*, Pattern UP, or DOWN the image pattern is, and it was made to output an actuation signal to the candidate for actuation corresponding to the image pattern recognized among the radio 4 currently installed in the vehicle interior of a room of an automobile, CD5, and air-conditioning equipment 6 alternatively as mentioned above according to this example.

[0037] That is, even if an operator is among an automobilism, only by building a specific sign with the left hand, and being shown in image pick-up within the limits of CCD camera 1, an actuation signal is alternatively outputted to the candidate for actuation according to the specific sign, and turning on and off and taking up and down of volume can be performed. Therefore, it becomes unnecessary to be able to check the location of an actuation switch established in the body of radio 4, CD5, etc. by the eye unlike the former, and even for the actuation switch to lengthen and operate a hand, and an operator can operate two or more candidates for actuation easily. Moreover, since the check of the front or a perimeter does not become whether to be a non-dense into an automobilism, it can operate safely.

[0038] Moreover, a configuration switch 11 forms in ECU2, and since the operator enabled it to set up beforehand the correspondence relation the specific sign shown with the left hand and for [which output an actuation signal] actuation, an operator can set up the correspondence relation of the sign and each devices 4-6 (for example, an easy sign is assigned to what has high actuation frequency) shown with the left hand so that it is easy that he may operate.

[0039] Moreover, since the pre input switch 9 for validating the output of the actuation signal from ECU2 was formed according to this example, only when a left hand will be picturized carelessly, an actuation signal is not made to output accidentally with CCD camera 1; when it is not necessary to operate it especially, and there is need, actuation of each devices 4-6 can be ensured.

[0040] According to this example, furthermore, CPU3 of ECU2 If an image pattern common to the on-off operation for specific actuation among each devices 4-6 is recognized Since an ON actuation signal will be outputted with reference to the on-off condition for [the] specific actuation with a flag if the candidate for specific actuation concerned is an OFF state, and an off actuation signal will be outputted if the candidate for specific actuation concerned is an ON state It is not necessary to make a specific sign able to respond about ON actuation and each OFF actuation, the number of signs required in order to operate each candidate for actuation can be lessened, and it becomes possible to operate it by the simple sign.

[0041] The specific sign shown with the left hand since the increment signal in a control input and a control input reduction signal are outputted to each devices 4-6 is communalized as Pattern UP and a pattern DOWN, respectively. Moreover, CPU3 The image pick-up range of CCD camera 1 is divided into the area A, B, and C corresponding to each devices 4-6. Since the increment signal in a control input or said control input reduction signal is outputted to the candidate for actuation corresponding to the area where it has recognized in the any Pattern UP or DOWN was picturized, and Pattern UP or DOWN has been recognized While not making the specific sign corresponding to the increment signal in a control input, and a control input reduction signal able to respond every device 4-6 and being able to lessen the number of signs, it can be operated more easily.

[0042] In addition, according to this example, since the information sound generator 12 makes each devices 4-6 generate [ECU /2] an information sound according to outputting an actuation signal, an operator can check whether the actuation signal has been certainly outputted to each devices 4-6 with the information sound.

[0043] This invention is not limited only to the example which described above and was indicated on the drawing, and following deformation or escapes are possible for it. Instead of the pre input switch 9, it constitutes from a momentary switch which carries out mho MENTARI actuation as a validation switch,

and an operator is made to become operational about the momentary switch in the location which usually attaches a hand to a handle. And an operator may be made to perform control according to the flow chart shown in drawing 4, only while carrying out ON actuation of the momentary switch in mho MENTARI actuation. Only when each devices 4-6 really need to be operated, an actuation signal can be made to output, if constituted in Mr. **. Moreover, what is necessary is just to form the pre input switch 9 if needed.

[0044] Only in the case of one, Pattern UP or DOWN does not need to distinguish in any of Area A, B, and C it was picturized, and the candidate for actuation in an ON state should just output the increment signal in a control input, and a control input reduction signal to it to the candidate for actuation in the ON state in step S4, and S5, S21, S22, S24 and S25. In this case, since an operator can make CCD camera 1 picturize the specific sign corresponding to Pattern UP or DOWN, without being conscious of Area A, B, and C, actuation becomes easy more. The airflow of air-conditioning equipment 6 may be set constant at the volume list of radio 4 and CD5, and the tune number number of the channel selection of radio 4 or CD5 and the laying temperature of air-conditioning equipment 6 may be changed by Pattern UP and DOWN. Or a separate pattern (sign) is assigned to these and you may make it operate it independently of volume or airflow.

[0045] It is not necessary to necessarily communalize the pattern (specific sign) corresponding to the on-off operation of each devices 4-6, and the pattern corresponding to ON actuation and off actuation may be set up separately. Before CPU3 outputs an ON actuation signal or an off actuation signal, it becomes unnecessary in that case, to distinguish the on-off condition of each devices 4-6.

[0046] Moreover, it is not necessary to communalize by each devices 4-6, and you may set up separately every device 4-6 also about Pattern UP or DOWN. It becomes unnecessary in that case, for CPU3 to distinguish by any of Area A, B, and C the image pick-up was performed in step S4, and S5, S21, S22, S24 and S25. Not only a left hand but a right hand may show a specific sign, and as long as it is a part of human being's body in short, you may make it any part show it. For example, when the direction of a look is recognized and the look has turned to the direction for [specific] actuation fixed time amount (for example, 0.5 seconds) by making [many / to some extent] the number of pixels used for CCD camera 1, it is also possible to constitute so that an actuation signal may be outputted to the specific candidate for actuation. The actuation signal and correspondence relation for [each] actuation which are outputted by a specific sign and its specific sign may be set up fixed that what is necessary is just to form a configuration switch 11 if needed. In that case, a setting means is omissible.

[0047] The information sound generator 12 may report the contents of the outputted actuation signal like "radio was turned on", "radio having been turned off" off, and "having raised the volume of CD" with voice. What is necessary is just to establish an actuation information means if needed. Although it was made to perform the increment or reduction of a control input by Pattern UP and Pattern DOWN by one step beforehand defined according to the image pick-up of one sign, according to the die length of the time amount the sign of Pattern UP and Pattern DOWN is indicated to be, it may be made to perform an increment or reduction of a control input one by one (making the number of steps increase). Without restricting to the vehicle interior of a room of an automobile, for example like the room where two or more AV equipments are installed in the residence, if it is an environment with two or more candidates for actuation, it can apply.

[0048]

[Effect of the Invention] Since this invention is as having explained above, the following effectiveness is done so. If according to the actuation signal output unit according to claim 1 a user slack operator builds a specific sign with a hand and shows the environment where two or more candidates for actuation are arranged like the vehicle interior of a room of an automobile for example, to predetermined within the limits, the specific sign will be picturized by the image pick-up means, and pattern recognition will be carried out with an image recognition means. Then, an actuation signal output means outputs an actuation signal to the candidate for actuation corresponding to the image pattern which the image recognition means has recognized alternatively. Therefore, it becomes unnecessary even for the actuation switch to lengthen and operate a hand, after checking the location of an actuation switch

established in candidates for actuation, such as radio and CD, and an operator can operate two or more candidates for actuation easily.

[0049] Since the setting means for setting beforehand the correspondence relation some image patterns of human being's body and for [which output an actuation signal] actuation as an actuation signal output means was established according to the actuation signal output unit according to claim 2, a user can set up the correspondence relation the sign shown by a part of body, and for [each] actuation so that it may be easy to operate itself.

[0050] According to the actuation signal output unit according to claim 3, if the common image pattern corresponding to the on-off operation for specific actuation is given, an actuation signal output means Since an ON actuation signal will be outputted if the candidate for specific actuation concerned is an OFF state, and an off actuation signal will be outputted with reference to the on-off condition for [concerned] specific actuation if the candidate for specific actuation concerned is an ON state In order to operate each candidate for actuation, the number of the specific signs shown by a part of body can be lessened, and it becomes possible to operate it by the simple sign.

[0051] According to the actuation signal output unit according to claim 4, an actuation signal output means If the image pattern with which it was communalized for an image recognition means to output the increment signal in a control input and a control input reduction signal to two or more candidates for actuation is recognized Since the increment signal in a control input or a control input reduction signal is outputted to the candidate for actuation corresponding to the partition where the image pattern concerned has been recognized While not setting up the specific sign corresponding to the increment signal in a control input, or a control input reduction signal for every candidate for actuation and being able to lessen the number of signs, it can be operated more easily.

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TECHNICAL FIELD

[Field of the Invention] This invention relates to the actuation signal output unit for outputting an actuation signal to two or more candidates for actuation.

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EFFECT OF THE INVENTION

[Effect of the Invention] Since this invention is as having explained above, the following effectiveness is done so. If according to the actuation signal output unit according to claim 1 a user slack operator builds a specific sign with a hand and shows the environment where two or more candidates for actuation are arranged like the vehicle interior of a room of an automobile for example, to predetermined within the limits, the specific sign will be picturized by the image pick-up means, and pattern recognition will be carried out with an image recognition means. Then, an actuation signal output means outputs an actuation signal to the candidate for actuation corresponding to the image pattern which the image recognition means has recognized alternatively. Therefore, it becomes unnecessary even for the actuation switch to lengthen and operate a hand, after checking the location of an actuation switch established in candidates for actuation, such as radio and CD, and an operator can operate two or more candidates for actuation easily.

[0049] Since the setting means for setting beforehand the correspondence relation some image patterns of human being's body and for [which output an actuation signal] actuation as an actuation signal output means was established according to the actuation signal output unit according to claim 2, a user can set up the correspondence relation the sign shown by a part of body, and for [each] actuation so that it may be easy to operate itself.

[0050] According to the actuation signal output unit according to claim 3, if the common image pattern corresponding to the on-off operation for specific actuation is given, an actuation signal output means Since an ON actuation signal will be outputted if the candidate for specific actuation concerned is an OFF state, and an off actuation signal will be outputted with reference to the on-off condition for [concerned] specific actuation if the candidate for specific actuation concerned is an ON state In order to operate each candidate for actuation, the number of the specific signs shown by a part of body can be lessened, and it becomes possible to operate it by the simple sign.

[0051] According to the actuation signal output unit according to claim 4, an actuation signal output means If the image pattern with which it was communalized for an image recognition means to output the increment signal in a control input and a control input reduction signal to two or more candidates for actuation is recognized Since the increment signal in a control input or a control input reduction signal is outputted to the candidate for actuation corresponding to the partition where the image pattern concerned has been recognized While not setting up the specific sign corresponding to the increment signal in a control input, or a control input reduction signal for every candidate for actuation and being able to lessen the number of signs, it can be operated more easily.

[Translation done.]

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TECHNICAL PROBLEM

[Problem(s) to be Solved by the Invention] for example, the thing on the vehicle interior of a room of an automobile, and directly relevant to automobilisms, such as a light, a wiper, a door, and a mirror, -- in addition, many candidates for actuation, such as radio called the so-called accessory, CD or air-conditioning equipment, and car navigation equipment, are arranged, and an operator drives an automobile, operating these suitably if needed. However, there are the following problems about the operating environment of the present condition over the candidate for actuation of these large number. [0003] First, actuation switches, such as radio, CD, and air-conditioning equipment, are in the inclination arranged intensively at the central part of an instrument panel, and the switch arranged at this part is far from an operator side, and it is hard to operate it. Moreover, since it is arranged intensively, it is unclear which actuation switch deals with which candidate for actuation only by glancing. Especially in volume adjustment of radio, airflow adjustment of air-conditioning equipment, etc., since the time amount by which the operator has turned the look to the switch side becomes long, front cautions will be neglected. This invention is made in view of the above-mentioned situation, and the purpose is in offering the actuation signal output unit which can operate two or more candidates for actuation easily.

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MEANS

[Means for Solving the Problem] In order to attain the above-mentioned purpose, an actuation signal output unit according to claim 1 The image pick-up means for picturizing a part of human being's body to predetermined within the limits, The image recognition means which carries out pattern recognition of some images of said human being's body picturized by this image pick-up means, It is characterized by providing an actuation signal output means to output an actuation signal to the candidate for actuation corresponding to the image pattern recognized by said image recognition means in for [two or more] actuation alternatively.

[0005] If are constituted in Mr. ** and an operator shows a specific sign (an index finger is upraised) to predetermined within the limits by a hand etc. in the environment where two or more candidates for actuation are arranged like the vehicle interior of a room of an automobile for example, the specific sign will be picturized by the image pick-up means. Pattern recognition of the picturized image is carried out by the image recognition means, and an actuation signal output means outputs an actuation signal to the candidate for actuation corresponding to the image pattern which the image recognition means has recognized alternatively. Therefore, it becomes unnecessary even for the actuation switch to lengthen and operate a hand, after checking the location of an actuation switch established in candidates for actuation, such as radio and CD, by the eye unlike the former, and an operator can operate two or more candidates for actuation easily.

[0006] In this case, as indicated to claim 2, it is desirable to establish the setting means for setting beforehand the correspondence relation some image patterns of said human being's body and for [which output said actuation signal / said] actuation as said actuation signal output means. If constituted in Mr. **, a user can set up the correspondence relation the sign shown by a part of body, and for [each] actuation so that it may be easy to operate itself.

[0007] As having indicated to claim 3, when the common image pattern corresponding to the on-off operation for [which has been recognized by said image-recognition means] specific actuation is given in said actuation signal output means, it is desirable in constituting so that it will output an ON actuation signal if the candidate for specific actuation concerned is an OFF state, and an off actuation signal may output with reference to the on-off condition for [concerned] specific actuation, if the candidate for specific actuation concerned is an ON state.

[0008] If constituted in Mr. **, by communalizing the specific sign shown by a part of body corresponding to ON actuation and OFF actuation, the number of said signs required in order to operate each candidate for actuation can be lessened, and it will become possible to operate it by the simple sign.

[0009] As indicated to claim 4, some image patterns of the body of said human being for outputting the increment signal in a control input and a control input reduction signal to said two or more candidates for actuation are communalized, respectively. Said image recognition means is divided into two or more partitions which correspond said predetermined range to said two or more candidates for actuation. Constitute possible [recognition in the any said image pattern was picturized], and if said image recognition means recognizes said image pattern, said actuation signal output means It is good to make

it the configuration which outputs said increment signal in a control input, or said control input reduction signal to the candidate for actuation corresponding to the partition where the image pattern concerned has been recognized.

[0010] If constituted in Mr. **, while not setting up the specific sign corresponding to the increment signal in a control input, and a control input reduction signal for every candidate for actuation and being able to lessen the number of said signs, it can be operated more easily.

[0011]

[Embodiment of the Invention] Hereafter, this invention is explained with reference to a drawing about one example at the time of applying to an automobile. CCD camera

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DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1] The functional block diagram of an electric configuration of that one example of this invention is shown

[Drawing 2] Drawing showing an example of the specific sign which a user shows with the left hand

[Drawing 3] Drawing showing the area A, B, C, and D which quadrisected the range where a CCD camera picturizes

[Drawing 4] The flow chart which shows the contents of control of CPU built in ECU

[Description of Notations]

1 -- a CCD camera (image pick-up means) and 3 -- CPU (an image recognition means, actuation signal output means) and 4 -- in radio (candidate for actuation), and 5, a pre input switch (validation switch) and 11 show a configuration switch (setting means), and, as for CD (candidate for actuation), and 6, 12 shows an information sound generator (actuation information means), as for air-conditioning equipment (candidate for actuation), and 9.

[Translation done.]

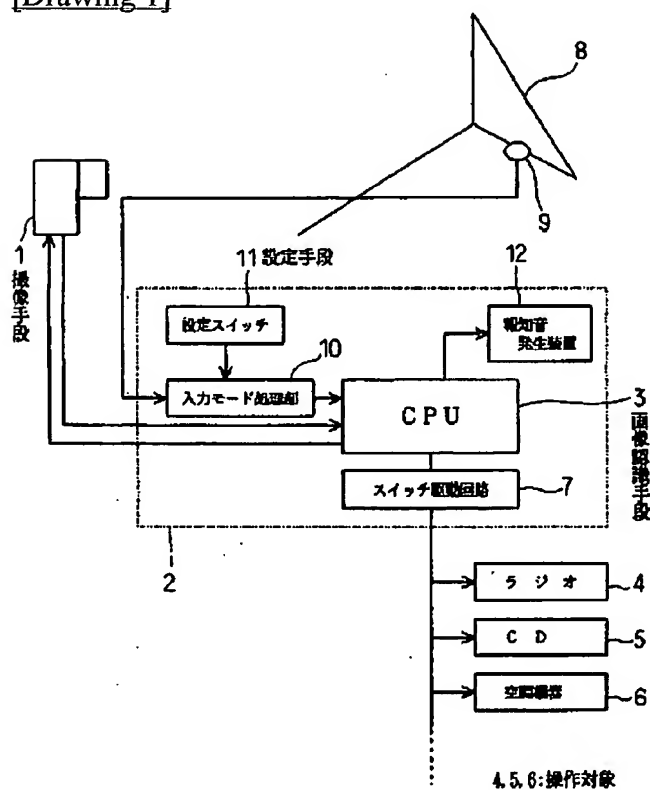
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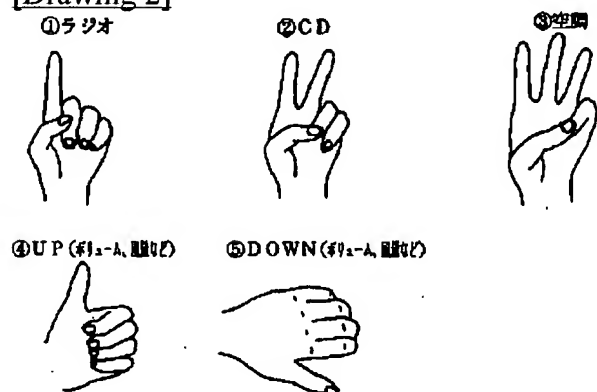
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DRAWINGS

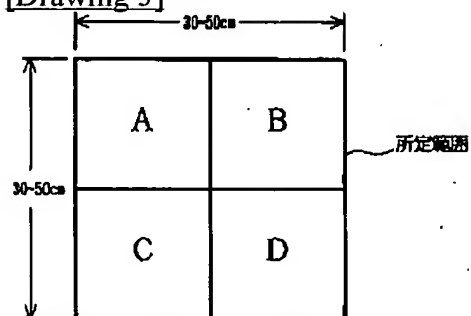
[Drawing 1]



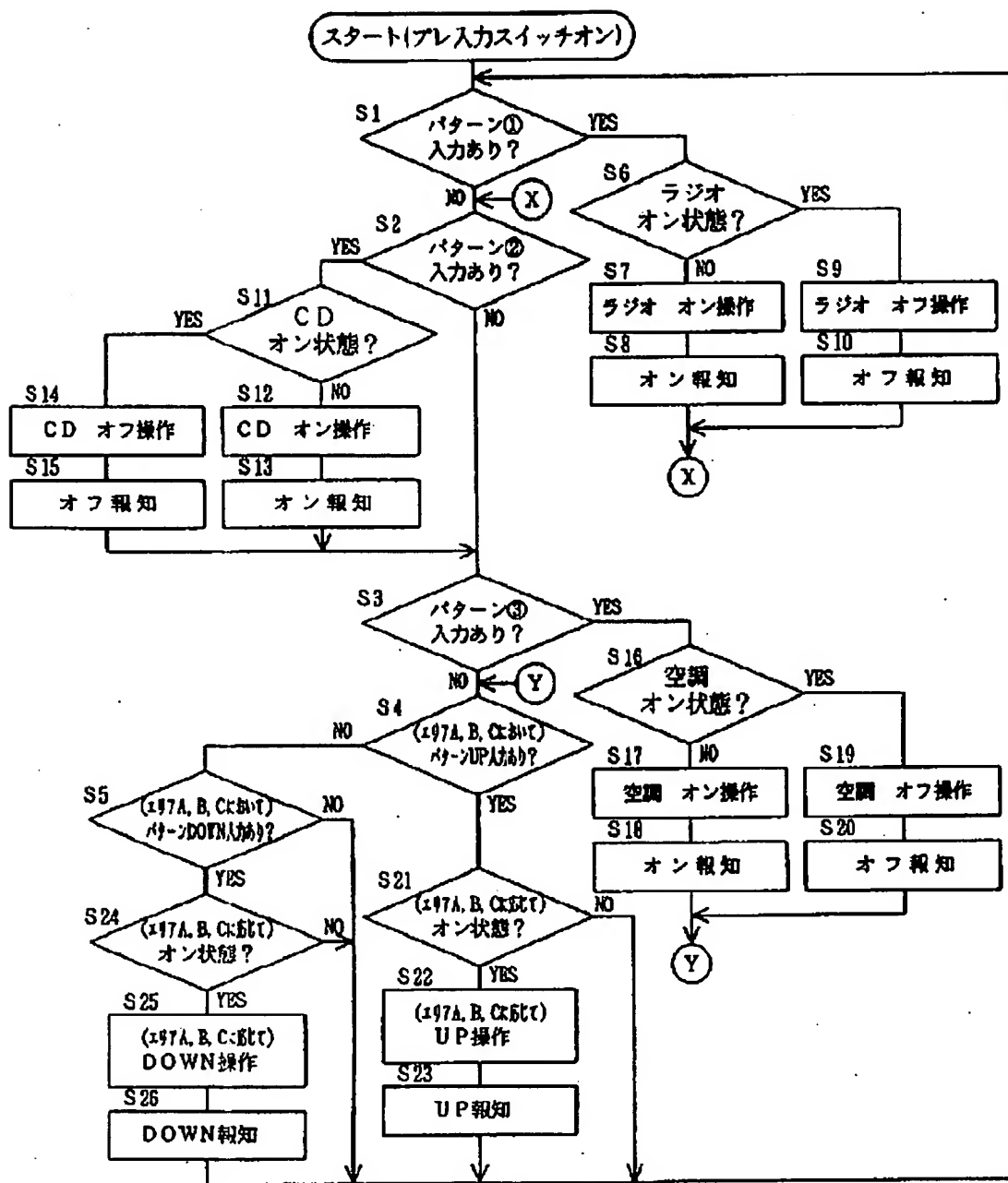
[Drawing 2]



[Drawing 3]



[Drawing 4]



[Translation done.]